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(54) Title: INOCULANT TOLERANT FUNGICIDAL COMPOSITIONS

(57) Abstract: An inoculant tolerant, aqueous fungicidal composition, is provided which is substantially free of organic solvents, comprising a fungicidally effective amount of at least one fungicidally active compound; a stabilizing effective and nitrogen-fixing bacteria tolerant amount of a preservative; and at least one anionic surfactant. The composition is tolerant to nitrogen-fixing bacteria such as Rhizobium spp. when applied concurrently or sequentially to plant propagation materials such as seeds; the inventive compositions are storage stable, ready-to-apply (RTA), ecologically and toxicologically favorable and have good fungicidal efficacy.

INOCULANT TOLERANT FUNGICIDAL COMPOSITIONS

1. TECHNICAL FIELD

The present invention relates to inoculant tolerant, aqueous fungicidal compositions, the preparation of such compositions and a method of using such compositions to combat phytopathogenic fungi. The fungicidal compositions of the invention have particular application in the protection of plant propagation materials, such as seeds, against fungal disease.

2. BACKGROUND OF THE INVENTION

The use of synthetic fungicides to control phytopathogenic fungi in crops is a wide spread practice. This practice has gained a high degree of commercial success because it has been shown that such control can increase crop yield. Fungicides typically are applied directly to plant propagation materials (such as seeds) prior to sowing and/or are used in foliar or furrow applications.

Another common practice used to increase crop yield is to inoculate seeds with an appropriate strain of nitrogen-fixing bacteria for the purpose of promoting plant growth. It is considered desirable for certain seeds to be inoculated with an effective bacterial strain such as Rhizobium spp. or Azospirillium spp. before sowing. The primary effect of such bacteria is in the fixation of atmospheric nitrogen into a useable form for the plant. Rhizobia bacteria, for example, form nodules on the plant roots and are sustained by the plant and in turn provide nitrogen for the plant as mentioned above.

Unfortunately, many fungicidal compositions may exhibit direct toxicity to the various strains of nitrogen-fixing bacteria when such compositions and bacteria are mixed together for seed treatment or when such compositions and bacteria are added to the seed sequentially.

There remains a need in the art for fungicidal compositions that may be effectively mixed with nitrogen-fixing bacteria, including sequential additions, for seed treatment.

3. SUMMARY OF THE INVENTION

It has now been found that a storage stable, aqueous fungicidal composition, which is substantially free of organic solvents, comprising at least one fungicidally active compound and at least one anionic surfactant is tolerant to nitrogen-fixing bacteria such as Rhizobium spp. when applied concurrently or sequentially to plant propagation materials such as seeds; the inventive compositions are storage stable, ready-to-apply (RTA), ecologically and toxicologically favorable and have good fungicidal efficacy.

Accordingly, the present invention provides an inoculant tolerant, aqueous fungicidal composition, which is substantially free of organic solvents, comprising:
a fungicidally effective amount of at least one fungicidally active compound;
a stabilizing effective and nitrogen-fixing bacteria tolerant amount of a preservative; and
at least one anionic surfactant.

In one embodiment, the preservative is present in the composition in an amount of from about 0.0001 to about 0.05% by weight of the composition.

In one embodiment, the aqueous fungicidal composition is an aqueous solution.

The invention further provides for a method for preparing the fungicidal composition which is achieved by intimately mixing the components with water, optionally using a concentrated premix of the preservative and one or more formulation components, until a homogeneous phase is achieved.

The invention also provides for plant propagation materials treated with the fungicidal composition and for a method for reducing fungal infestation and for promoting the growth of plant propagation materials such as seeds. The method comprises contacting the seeds with the aqueous fungicidal composition described above either before, during or after addition of a plant growth-promoting amount of a nitrogen-fixing bacterium to the seed.

4. DETAILED DESCRIPTION OF THE INVENTION

The term "fungicidally active compound" as utilized herein is intended to cover compounds active against phytopathogenic fungi that may belong to a very wide range of compound classes. Examples of compound classes to which the suitable fungicidally active compound may belong include: triazole derivatives, strobilurins, carbamates, benzimidazoles (thiabendazole), N-trihalomethylthio compounds (captan), substituted benzenes, carboxamides, phenylamides and phenylpyrroles, and mixtures thereof.

Examples of suitable individual compounds of the above mentioned compound classes are listed below. Where known, the common name is used to designate the individual compounds (q.v. the Pesticide Manual, 11th edition, 1997, British Crop Protection Council).

Suitable triazole derivatives include propiconazole, difenconazole and tebuconazole.

Suitable strobilurins include trifloxystrobin, azoxystrobin and kresoxim-methyl.

Suitable carbamates include thiram.

Suitable substituted benzenes include PCNB and chlorothalonil.

Suitable carboxamides include carboxin.

A preferred phenylamide usable in the compositions and methods falling within the scope of the present invention include metalaxyl; metalaxyl consisting of more than 70% by weight of the R-enantiomer; metalaxyl consisting of more than 85% by weight of the R-enantiomer; metalaxyl consisting of more than 92% by weight of the R-enantiomer; metalaxyl consisting of more than 97% by weight of the R-enantiomer; and mefenoxam (i.e., R-metalaxyl or metalaxyl-M).

A specific phenylpyrrole usable in the compositions and methods falling within the scope of the present invention is fludioxonil.

The fungicidally active compounds are employed in a fungicidally effective amount in the composition.

Mixtures of one or more of the foregoing fungicidally active compounds also are usable as an active component in the practice of the present invention.

Preservatives useful in the practice of the invention include ascorbic acid, ascorbyl palmitate, benzoic acid, hexamethylenetetramine, propyl p-hydroxybenzoate, sodium propionate, sorbic acid (and potassium salt), sulfurous acid, 1,2-benzisothiazolin-3-one, 5-Chloro-2-methyl-4-isothiazolin-3-one (in combination with 2-methyl-4-isothiazolin-3-one), formaldehyde, magnesium nitrate (in combination with 2-meth-yl-4-isothiazolin-3-one and 5-chloro-2-methyl-4-isothiazolin-3-one), methyl p-hydroxybenzoate, 2-methyl-4-isothiazolin-3-one (in combination with 5-chloro-2-methyl-4-isothiazolin-3-one), paraformaldehyde, sodium o-phenylphenate, ascorbyl palmitate, benzoic acid, methyl-p-hydroxybenzoate (methyl paraben), propyl p-hydroxybenzoate (propyl paraben), and sodium benzoate.

Preservatives containing 1,2-benzisothiazolin-3-one are preferred.

The preservative is present in the fungicidal composition in a stabilizing effective and nitrogen-fixing bacteria tolerant amount. In one aspect, the preservative is present from 0.0001 to about 0.05 % by weight of the composition. More particularly, the preservative is present in an amount of from 0.005 to about 0.02 % by weight, preferably 0.005 to 0.01 % by weight.

The inoculent tolerant fungicidal compositions in accordance with the invention may take the form of aqueous solutions, dispersions, suspensions, emulsions or suspoemulsions. The composition is preferably a ready for use solution.

The aqueous composition of the invention is substantially free of organic solvents; i.e. the amount of organic solvent is less that 0.5%. Some commercially available materials may contain a small amount of organic solvent, which, when more than about 0.1% can

be removed for example in a separator. In one aspect, the aqueous composition may contain polyhydrate alcohols such as glycerin.

In particular, the aqueous composition of the invention is substantially free of nonaqueous solvents (0 to 0.5% by weight, preferably 0 to less than about 0.1 % by weight). As organic, nonaqueous solvents there may be mentioned N-methyl-2-pyrrolidone and 1-octyl-2-pyrrolidone.

The ready-to-apply (RTA) aqueous compositions according to the invention are stable for at least 12 months at 25°C.

In one embodiment, the present invention provides an aqueous fungicidal composition, which is substantially free of organic solvents, comprising
a) a fungicidally effective amount of at least one fungicidally active compound,
b) a stabilizing effective and nitrogen-fixing bacteria tolerant amount of a preservative;
and comprising as auxiliaries:

c1) at least one anionic surfactant; and
c2) at least one nonionic surfactant.

The composition optionally contains (d) at least one thickener.

Mixtures of at least one ambient liquid fungicide (for example, a phenylamide such as R-metalaxyl) and at least one ambient solid fungicide (for example, a phenylpyrrole such as fludioxonil) are preferred.

Advantageous mixing ratios of the phenyl amide (I) and phenylpyrrole (II) are I:II=from 10:1 to 1:30, preferably I:II=from 7:1 to 1:20. In many cases, mixtures in which the mixing ratio of the active substances I:II is from 7:1 to 1:10, e.g. from 7:1 to 1:1 are advantageous. Other advantageous mixing ratios are 6:1, 7:2, 2:3.

In one embodiment, the fungicidally active compound(s) is present in the composition in an amount of from about 0.5 % to about 10 % by weight.

Suitable auxiliaries include surfactants, thickeners and other agronomically acceptable auxiliaries and adjuvants employed in the pesticide formulation art.

Suitable anionic surfactants are in general oligomers and polymers, as well as polycondensates, which contain a sufficient number of anionic groups to ensure their water-solubility. Examples of suitable anionic groups are sulfo groups or carboxyl groups; but polymers containing carboxyl groups can only be used in the higher pH range, preferably at a pH higher than 5. The number of anionic groups per polymer molecule is usually at least 60% of the number of monomer units contributing to the structure of the molecule. Oligomers and polymers that contain sulfo groups can be prepared either by polymerising monomers that contain sulfo groups or by sulfonating the appropriate oligomers or polymers. Polymers that contain carboxyl groups can be obtained by saponifying polyacrylates or polymethacrylates, in which case the degree of saponification must be at least 60%. Particularly suitable anionic surfactants are sulfonated polymers and condensates of aromatic sulfonic acids with formaldehyde. Typical examples of such anionic surfactants are:

Salts of polystyrenesulfonic acid, in particular the alkali metal, alkaline earth metal and ammonium salts, and the salts of organic amines which can be obtained by polymerising styrenesulfonic acid or salts thereof or by sulfonation of polystyrene and subsequent neutralisation with a suitable base, in which latter case the degree of sulfonation must be at least 60%.

Salts of polyvinylsulfonic acid, in particular the alkali metal, alkaline earth metal and ammonium salts, and the salts with organic amines which can be obtained by polymerising vinylsulfonic acid or salts therof. Salts of condensates of naphthalene-sulfonic acids, preferably naphthalene-2-sulfonic acid, with formaldehyde, in particular the alkali metal, alkaline earth metal and ammonium salts, and salts thereof with organic amines which can be obtained by sulfonation of naphthalene, condensation of the resultant naphthalenesulfonic acids with formaldehyde, and neutralisation with a suitable base. The molecular weight of these compounds is in the range from about 500 to 6000.

Salts of condensates of naphthalenesulfonic acid with phenolsulfonic acid and formaldehyde, in particular the alkali metal, alkaline earth metal and ammonium salts, and salts with organic amines. These products are sulfo group containing polymers with an average molecular weight of 6000 to 8000, in which the monomer units naphthalene and phenol are linked to each other partly through methylene groups and partly through sulfo groups.

Salts of ligninsulfonic acid, in particular the sodium, potassium, magnesium, calcium or ammonium salt. Prefered anionic surfactants include α-[2,4,6-tris[1-(phenyl)ethyl]phenyl]-ω-hydroxypolyoxy(ethylene), mixture of monohydrogen and dihydrogen phosphate esters, such as those having a poly(oxyethylene) content of from about 4 to about 150 moles. Suitable anionic surfactants can be prepared by methods known per se and also are commercially available.

In one aspect, the anionic surfactant(s) is present in the composition in an amount of from about 0.3 % to about 5 % by weight.

It may be advantageous to add additionally a nonionic surfactant and a thickener to the aqueous fungicidal composition.

Suitable nonionic surfactants, when present, are in general nonionic water-soluble polymers having an average molecular weight of below 20,000. Particularly suitable nonionic surfactants of this kind are the products which can be obtained by reaction of ethylene oxide, or by the combined reaction of ethylene oxide and propylene oxide, with fatty alcohols, alkylphenols, fatty acids, fatty acid esters of polyhydroxy compounds, fatty acid amides and fatty amines, where the number of ethylene oxide and propylene oxide units may vary within wide limits. In general, the number of ethylene oxide units or ethylene oxide and propylene oxide units is from 1 to 200, preferably from 5 to 100 and, most preferably, from 8 to 40.

Preferred nonionic sufactants include α-butyl-ω-hydroxypropyl-(oxypropylene) block polymers with poly(oxyethylene) such as those with a molecular weight of from 2400 to 3500, and α-[2,4,6-tris[1-(phenyl)ethyl]phenyl]-ω-hydroxypolyoxy(ethylene) such as

those having a poly(oxyethylene) content of from about 4 to about 150 moles. Suitable nonionic surfactants can be prepared by methods known per se and also are commercially available.

Illustrative of thickeners (water-soluble polymers which exhibit pseudoplastic properties in an aqueous medium) are gum arabic, gum karaya, gum tragacanth, guar gum, locust bean gum, xanthan gum, carrageenan, alginate salt, casein, dextran, pectin, agar, 2-hydroxyethyl starch, 2-aminoethyl starch, 2-hydroxyethyl cellulose, methyl cellulose, carboxymethyl cellulose salt, cellulose sulfate salt, polyacrylamide, alkali metal salts of the maleic anhydride copolymers, alkali metal salts of poly(meth)acrylate, and the like.

As suitable thickeners there may also be mentioned attapulgite-type clay, carrageenan, croscarmellose sodium , furcelleran , glycerol, hydroxypropyl methylcellulose, polystyrene, hydroxypropyl cellulose, hydroxypropyl guar gum, and sodium carboxymethylcellulose. Xanthan gum is preferred.

The aqueous composition according to the invention can be employed together with the adjuvants customary in formulation technology, further carriers, surfactants (cationic, anionic, nonionic, amphoteric), emulsifiers (lethicin, sorbitan, and the like), antifreeze agents (glycerin), dyes, antifoam agents or application-promoting adjuvants customarily employed in the art of formulation. In addition, there may be mentioned inoculants, brighteners and polymers.

The inventive compositions contain and/or may be applied together or sequentially with further active compounds. These further compounds can be fertilizers or micronutrient donors or other preparations that influence plant growth. They can also be selective herbicides, insecticides, fungicides, bactericides, insect growth regulators, plant growth regulators, nematicides, molluscicides or mixtures of several of these preparations.

In particular, sodium molybdate is mentioned as an additional fungicidally active ingredient.

The aqueous fungicidal compositions of the invention can be prepared by a process which comprises the steps: (a) forming a premix with a preservative and (i) at least one fungicidally active compound and/or (ii) at least one formulation auxiliary, wherein the preservative in the premix is at a concentration that is toxic to nitrogen-fixing bacteria; (b) diluting the premix of step (a) with water while concurrently or sequentially adding the remaining ingredients; and (c) stirring the mixture to form a homogeneous composition, wherein the preservative is present in the final composition in a stabilizing effective and nitrogen-fixing bacteria tolerant amount.

Advantageously, step (b) is carried out sequentially to allow a homogenous precursor composition to be achieved before the additional component(s) are added.

In one aspect, solid fungicidally active compounds may be milled prior to being added.

The final composition can be screened to remove any insoluble particles.

Suitable concentrations of the components in relation to the total weight of the aqueous fungicidal composition comprise:
1) of the fungicidally active compound or mixture of compounds: 0.5 to 10 %, preferably 0.1 to 5 %, more preferred 0.5 to 2% fungicidally active compounds in relation to the total composition;
2) of the surfactants: 0.5 to 20%, including 0.3 to 5% of an anionic surfactant; and
3) of the preservative: 0.0001 to about 0.05 %, preferably 0.005 to about 0.02 % by weight, more preferred 0.005 to 0.01 % by weight.

The aqueous fungicidal compositions of the invention are formulated for protecting cultivated plants and their propagation materials. The inventive compositions are advantageously formulated for seed treatment applications against diseases in the soil, which mostly occur in the early stages of plant development. For example, the compositions can be formulated to target pathogens including Pythium, Tilletia, Gerlachia, Septoria, Ustilago, Fusarium, Rhizoctonia (so-called "damping off complex"); Oomycetes such as Phytophthora, Plasmopara, Pseudoperonospora, Bremia etc. as

well as against the Botrytis species, Pyrenophora, Monilinia and further representatives of the Ascomycetes, Deuteromycetes and Basidiomycetes classes.

Suitable target crops are especially potatoes, cereals, (wheat, barley, rye, oats, rice), maize, sugar beet, cotton, millet varieties such as sorghum, sun flowers, beans, peas, oil plants such as rape, soybeans, cabbages, tomatoes, eggplants (aubergines), pepper and other vegetables and spices as well as ornamental shrubs and flowers.

The inventive compositions are particularly suited for dressing applications on plant propagation material. The latter term embraces seeds of all kinds (fruit, tubers, grains), cuttings, cut shoots and the like. The preferred field of application is the treatment of all kinds of seeds (as specified in the target crops above), and in particular the seed treatment of soybeans and other legumes and crops that are susceptible to Rhizobium symbiosis that results from the deliberate coating of a legume seed with the appropriate Rhizobium spp. prior to planting.

The techniques of seed treatment application are well known to those skilled in the art, and they may be used readily in the context of the present invention. The aqueous fungicidal composition of the invention is applied to the seed as slurry or a soak. There also may be mentioned, e.g., film coating or encapsulation. The coating processes are well known in the art, and employ, for seeds, the techniques of film coating or encapsulation, or for the other multiplication products, the techniques of immersion. Needless to say, the method of application of the inventive compositions to the seed may be varied and the invention is intended to include any technique that is to be used.

A preferred method of applying the aqueous fungicidal composition according to the invention consists in spraying or wetting the plant propagation material with the aqueous liquid preparation, or mixing the plant material with such liquid preparation.

As noted above, the compositions of this invention may be formulated or mixed in the seed treater tank or combined on the seed by overcoating with other seed treating agents. The agents to be mixed with the compounds of this invention may be for the

control of pests, nutrition, the control of plant diseases, or for the modification of plant growth, especially with nitrogen-fixing bacteria.

The inventive aqueous fungicidal composition has particular application to concurrent (such as by slurry) and sequential seed treatments with a plant growth promoting amount of a nitrogen-fixing bacteria including Rhizobia spp.. Suitable Rhizobia formulations can be prepared by methods known per se and also are commercially available. Among the suitable Rhizobia formulations there may be mentioned Cell-Tech 2000 ™ available from Lipha Tech (Milwaukee WI).

EXAMPLES

The following non-limiting Examples illustrate the invention in more detail.

Preparation Example

The registered trademarks and other designations denote the following products:

Soprophor BSU	(Rhodia)	α-[2,4,6-tris[1-(phenyl)ethyl]phenyl]-ω-hydroxypolyoxy(ethylene)
Soprophor 3D-33	(Rhodia)	α-[2,4,6-tris[1-(phenyl)ethyl]phenyl]-ω-hydroxypolyoxy(ethylene), mixture of monohydrogen and dihydrogen phosphate esters
Witconol NS 500LQ	(Witco)	α-butyl-ω-hydroxypropyl-(oxypropylene) block polymer with poly(oxyethylene)
Rhodopol 23	(Rhodia)	Xanthan Gum
Proxel GXL	(Zeneca)	Preservative containing 1,2-benzisothiazolin

% WT of the total composition. The components are intimately mixed until a homogeneous phase is achieved.

Example 1

% WT	Component	Type
0.77	Fludioxonil	Fungicide
1.11	Mefenoxam (R-metalaxyl)	Fungicide
10.80	Glycerin	Antifreeze
0.69	Soprophor BSU	Nonionic surfactant
0.65	Soprophor 3D-33	Anionic surfactant
0.39	Witconol NS 500LQ	Nonionic surfactant
0.03	Antifoam A (Dow Corning)	Defoaming agent
0.22	Rhodopol 23	Thickener
0.02	Proxel GXL	Preservative
3.00	FD&C Blue #1	Dye
82.32	Water	Solvent

Biological Example

Soybean nodulation is evaluated at 37 days after planting. The data was analyzed at a 95 % confidence level; Coefficient of Variance = 28.3 %; Least Significant Difference = 3.359.

Treatment	Nodules per Plant	Mean Separation
a) Rhizobia (Cell-Tech 2000)	12.5	A
b) Example 1 (slurry w/ A)	12.2	AB
c) Uninoculated	3.4	EF

Although the foregoing invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it will be apparent that various changes and modifications may be practiced within the scope of the appended claims.

What is claimed is:

1. An inoculant tolerant, aqueous fungicidal composition, which is substantially free of organic solvents, comprising:
   a) a fungicidally effective amount of at least one fungicidally active compound;
   b) a stabilizing effective and nitrogen-fixing bacteria tolerant amount of a preservative; and
   c) at least one anionic surfactant.

2. A composition according to claim 1, wherein the fungicidally active compound belongs to a class selected from the group consisting of triazole derivatives, strobilurins, carbamates, benzimidazoles, N-trihalomethylthio compounds, substituted benzenes, carboxamides, phenylamides and phenylpyrroles.

3. A composition according to claim 1, wherein the fungicidally active compound is selected from the group consisting of thiram, PCNB, chlorothalonil, carboxin, metalaxyl, metalaxyl consisting of more than 92% by weight of the R-enantiomer, R-metalaxyl and fludioxonil.

4. A composition according to claim 1, wherein the fungicidally active compound is present in the composition in an amount of from about 0.5 % to about 10 % by weight of the total composition.

5. A composition according to claim 1, wherein the anionic surfactant is present in the composition in an amount of from about 0.3 to 5 % by weight of the total composition.

6. A composition according to claim 1, wherein the preservative is present in the composition in an amount of from about 0.005 to about 0.02 % by weight of the total composition.

7. A composition according to claim 6, wherein the preservative contains 1,2-benzisothiazolin-3-one.

8. A composition according to claim 1, which further comprises at least one nonionic surfactant.

9. A composition according to claim 1, which further comprises at least one at least one thickener.

10. A composition according to claim 1, wherein the fungicidally active component a) comprises at least one ambient liquid fungicide and at least one ambient solid fungicide.

11. A composition according to claim 10, wherein the ambient liquid fungicide is metalaxyl consisting of more than 92% by weight of the R-enantiomer.

12. A composition according to claim 10, wherein the ambient solid fungicide is fludioxonil.

13. Plant propagation material treated with a composition according to claim 1.

14. The plant propagation material according to claim 13 comprising soybean seed.

15. A method for reducing fungal infestation of plants, parts of plants, and seeds, and for promoting plant growth, which comprises
contacting plant propagation material with a fungicidally effective amount of a composition of claim 1; and
inoculating said plant propagation material in any desired sequence, simultaneously or in succession, with a plant growth promoting effective amount of a nitrogen-fixing bacterium.

16. A method according to claim 15 wherein said plant propagation material comprises soybean seed.

17. A method according to claim 15 wherein said nitrogen-fixing bacteria comprises a Rhizobium spp. bacterium.

INTERNATIONAL SEARCH REPORT

national Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A01N43/80 A01N37/36 A01N43/36 A01N63/00 A01N25/30
A01C1/06 //(A01N43/80,63:00,43:36,37:36)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A01N A01C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4 161 397 A (BELLET EUGENE M ET AL) 17 July 1979 (1979-07-17) the whole document ---	1-17
Y	EP 0 790 000 A (CIBA GEIGY AG) 20 August 1997 (1997-08-20) page 2 -page 3, line 43 page 4, line 35 - line 49 page 5, line 14 - line 29; claims --- -/--	1-12

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA	Authorized officer
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Form PCT/ISA/210 (second sheet) (July 1992)

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99 40784 A (NOVARTIS ERFIND VERWALT GMBH ;PFAMMATTER FREDDY (CH); SCHLATTER CH) 19 August 1999 (1999-08-19) page 1, paragraph 1 - paragraph 3 page 2, fourth line from the bottom - page 3, paragraph 1 page 5, paragraph 3 -page 6, paragraph 1; claim 1; example 1 page 5, paragraph 3	1-12
A	WO 95 00019 A (ZENECA LTD ;PAYNE JOHN DAVID (GB)) 5 January 1995 (1995-01-05) page 1 -page 3, line 23; claims	1-17
A	US 5 846 905 A (DAMO ZOLTAN ET AL) 8 December 1998 (1998-12-08) column 2, line 54 -column 5, line 12 column 8, line 4 - line 17; claims 1,6,19,20; tables	1-17
A	US 4 306 027 A (ALEXANDER MARTIN ET AL) 15 December 1981 (1981-12-15) column 2, line 50 -column 3, line 24 column 4, line 29 - line 46	1-17
A	EP 0 609 099 A (SANKYO CO) 3 August 1994 (1994-08-03) page 3 -page 5, line 30 page 7, line 2 - line 4; claims 1,19,20,23,34,35	1,6
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FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Present claims 1-17 relate to compositions, materials treated with such compositions and methods using them, in which components of said compositions are defined by reference to a desirable property, namely that they are tolerable by nitrogene fixing bacteria while being present in an effective amount. This property is stated explicitly for component b) i.e. the preservative but is also required implictly for the fungicidally active compound.
The claims cover all compositions comprising components having this property, whereas the application provides support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT for only a very limited number of such components. As a whole the composition is thus defined by reference to the results to be achieved, namely being fungicidal and inoculant tolerant, by characterising its active components as being at the same time effective and inoculant tolerant. This lack of disclosure (Articie 5 PCT), support and clarity (Article 6 PCT) in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to compositions comprising 1,2-benzoisothiazolin-3-one as the preservative and at least one of the compounds listed in claim 3 as the fungicidally active compound.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

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